UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/574,743	04/06/2006	Kyeong-Cheol Lee	038779/309783	2487

826 7590 07/24/2007

ALSTON & BIRD LLP
BANK OF AMERICA PLAZA
101 SOUTH TRYON STREET, SUITE 4000
CHARLOTTE, NC 28280-4000

EXAMINER	
KUO, WENSING W	

ART UNIT	PAPER NUMBER
2809	

MAIL DATE	DELIVERY MODE
07/24/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/574,743	LEE, KYEONG-CHEOL	
	Examiner	Art Unit	
	W. Wendy Kuo	2809	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *06 April 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-19* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-19* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *06 April 2006* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *06 April 2006*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1-5, 7, 9-11, and 15-18 are rejected under 35 U.S.C. 102(b) as being anticipated by Shimizu et al., US 6,577,073.

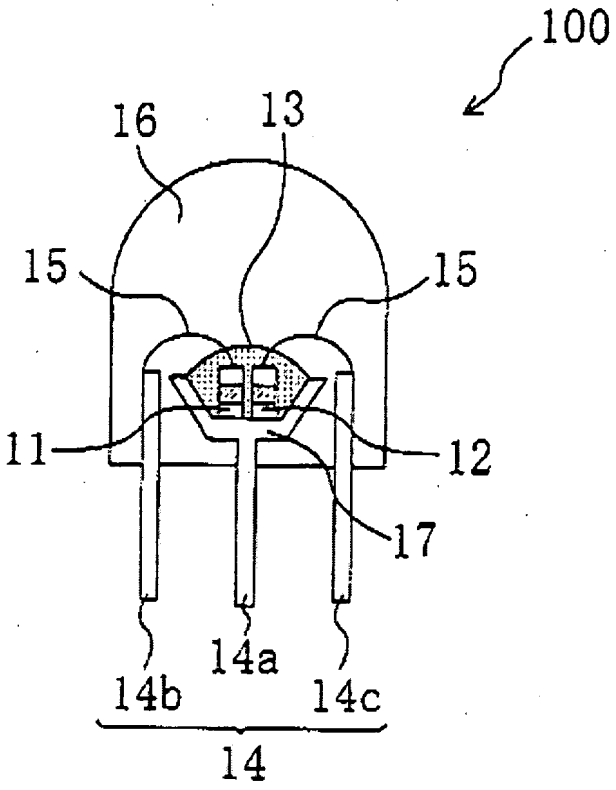
3. With respect to claim 1, Shimizu et al. teach in Figure 1, a semiconductor light emitting device comprising:

A package 100 having two or more terminals (14a-14c);

Two or more semiconductor devices (11, 12) mounted in the package to emit lights, each having a predetermined wavelength (column 12, lines 3-14); and

A molding unit 16 mixed with a phosphor 13 that is excited by the lights emitted from the semiconductor devices (column 6, lines 4-6) to emit light having a wavelength different from those of the lights emitted from the semiconductor devices (column 6, lines 28-36).

FIG. 1



4. With respect to claim 2, Shimizu et al. teach that the semiconductor devices (11, 12) include two or more semiconductor device groups (blue and red) emitting lights having a wavelength in a different visible ray range from each (column 12, lines 3-14).

5. With respect to claim 3, Shimizu et al. teach that the semiconductor devices (11, 12) includes one or more devices emitting blue light and one or more devices emitting red light (column 12, lines 3-14).

6. With respect to claim 4, Shimizu et al. teach that the semiconductor device emitting blue light has a peak wavelength of about 430-480 nm (column 12, lines 3-7).

7. With respect to claim 5, Shimizu et al. teach that the semiconductor device emitting the red light has a peak wavelength of about 610-700 nm (column 12, lines 3-14).

8. With respect to claim 7, Shimizu et al. teach that the molding unit 16 is formed of a mixture of phosphor 13 and a molding material (column 7, lines 21-25), the phosphor being designed to emit green light when it is excited by the light emitted from the semiconductor device (column 5, lines 23-26).

9. With respect to claim 9, Shimizu et al. teach that the molding unit 16 is formed of a mixture of phosphor 13 and a molding material (column 7, lines 21-25), the phosphor being designed to emit red light when it is excited by the light emitted from the semiconductor device (column 2, lines 9-12; column 8, lines 30-32).

10. With respect to claim 10, Shimizu et al. teach that at least one of the semiconductor devices emits light having a similar color to that of the light emitted from the phosphor (blue-green LED chip with a peak wavelength of 540 nm and a phosphor having a peak wavelength between 540 and 590 nm) (column 6, lines 20-36).

11. With respect to claim 11, Shimizu et al. teach that the semiconductor devices include one or more red light emitting devices 12 and one or more blue light emitting devices 11 (column 5, lines 4-9), and the phosphor 13 is designed to emit green light when it is excited by the light emitted from the semiconductor devices (column 5, lines 23-26), thus the semiconductor light emitting device radiates white light (column 1, lines 5-7).

12. With respect to claim 15, Shimizu et al. teach that the semiconductor device includes an LED (column 2, lines 30-31).

13. With respect to claim 16, Shimizu et al. teach that the semiconductor devices are connected to each other in series, in parallel, or in series-parallel (column 7, lines 52-59).

14. With respect to claim 17, Shimizu et al. teach a method for making a semiconductor light emitting device, comprising the steps of:

Mounting two or more semiconductor devices (11, 12) on a package 100 having two or more terminals (14a-14c) (column 7, lines 8-12);

Electrically connecting the semiconductor devices to each other using a conductive wire (column 6, lines 58-67; column7, lines 55-59);

Forming a molding unit 16 by molding a mixture of a phosphor 13 and a transparent molding material (column 7, lines 23-25), the phosphor being excited by the lights emitted from the semiconductor devices (column 6, lines 4-6) to emit light having a wavelength different from those of the lights emitted from the semiconductor devices (column 6, lines 28-36; column 12, lines 3-14).

15. With respect to claim 18, Shimizu et al. teach that the transparent molding material is selected from the group consisting of epoxy resin, urea resin, and silicone (column 7, lines 32-25).

Claim Rejections - 35 USC § 103

16. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

17. Claims 6 and 12-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shimizu et al., US 6,577,073 in view of Marshall et al., US 6,513,949.

18. With respect to claim 6, Shimizu et al. remains as applied to claim 1 above.

Shimizu et al. fail to teach that at least one of the semiconductor devices emits light in an ultraviolet ray range. Marshall et al. teach in Figure 3 that at least one of the semiconductor devices 36 emits light in an ultraviolet ray range for the benefit of providing a hybrid lighting system that exhibits improved performance over conventional LED lighting systems (column 1, lines 9-12) and for improved color rendering (column 2, line 60).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the semiconductor light emitting device of Shimizu et al. with the semiconductor device of Marshall et al. that emits light in an ultraviolet ray range for the benefit of providing a hybrid lighting system that exhibits improved performance over conventional LED lighting systems and for improved color rendering.

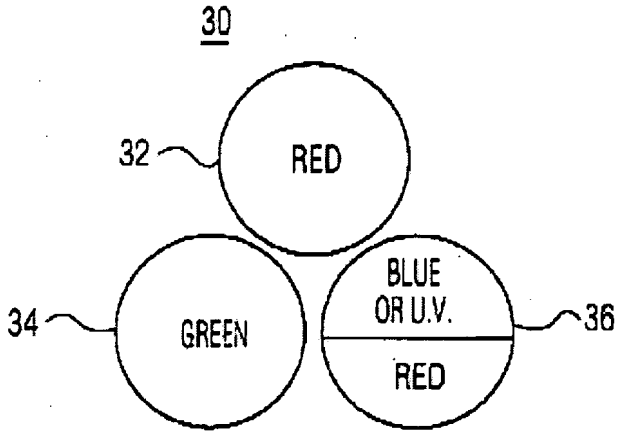


FIG. 3

19. With respect to claim 12, Shimizu et al. remains as applied to claim 11 above.

Shimizu et al. fail to teach that the semiconductor light emitting device further comprises one or more green light emitting devices. Marshall et al. teach in Figure 3 that the semiconductor light emitting device further comprises one or more green light emitting devices 34 (column 3, lines 47-53) for the benefit of providing maximum lumen content while permitting the color temperature to be freely adjusted (column 3, lines 61-63).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the semiconductor light emitting device of Shimizu et al. with the green light emitting device of Marshall et al. for the benefit of providing maximum lumen content while permitting the color temperature to be freely adjusted.

20. With respect to claim 13, Shimizu et al. remains as applied to claim 1 above.

Shimizu et al. teach that the semiconductor devices include one or more blue light emitting devices (column 5, lines 4-9), and the phosphor is designed to emit red light when it is excited by light emitted from the semiconductor devices (column 2, lines

9-12; column 8, lines 30-32), thus the semiconductor light emitting device radiates white light (column 1, lines 5-7).

Shimizu et al. fail to teach that the semiconductor devices include one or more green light emitting devices. Marshall et al. teach in Figure 3 that the semiconductor light emitting device includes one or more green light emitting devices 34 (column 3, lines 47-53) for the benefit of providing maximum lumen content while permitting the color temperature to be freely adjusted (column 3, lines 61-63).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the semiconductor light emitting device of Shimizu et al. with the green light emitting device of Marshall et al. for the benefit of providing maximum lumen content while permitting the color temperature to be freely adjusted.

21. With respect to claim 14, Shimizu et al. in view of Marshall et al. remains as applied to claim 13 above.

Shimizu et al. further teach that the semiconductor light emitting device further comprises one or more red light emitting devices (column 5, lines 4-9).

22. Claims 8 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shimizu et al., US 6,577,073 in view of Tarsa et al., US 7,005,679.

23. With respect to claim 8, Shimizu et al. remains as applied to claim 7 above.

Shimizu et al. further teach that the phosphor has an emitting wavelength of about 500-570 nm (column 6, lines 28-36).

Shimizu et al. fail to teach that the phosphor has an excitation wavelength of about 200-550 nm. Tarsa et al. teach that the phosphor has an excitation wavelength of

about 200-550 nm (column 7, lines 32-34) for the benefit of providing solid-state white emitting lamps with high efficacy and good color rendering (column 3, lines 53-55) and for utilizing a wider variety of high efficiency phosphors (column 7, lines 32-34).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the semiconductor light emitting device of Shimizu et al. with the phosphor of Tarsa et al. that has an excitation wavelength of about 200-550 nm for the benefit of providing solid-state white emitting lamps with high efficacy and good color rendering (column 3, lines 53-55) and for utilizing a wider variety of high efficiency phosphors (column 7, lines 32-34).

24. With respect to claim 19, Shimizu et al. remains as applied to claim 17 above.

Shimizu et al. further teach that the semiconductor devices comprise a blue chip having a peak wavelength of about 430-480 nm and a red chip having a peak wavelength of about 610-700 nm (column 12, lines 3-14), and the phosphor has an emitting wavelength of about 500-570 nm (column 11, lines 11-15).

Shimizu et al. fail to teach that the phosphor has an excitation wavelength of about 200-550 nm. Tarsa et al. teach that the phosphor has an excitation wavelength of about 200-550 nm (column 7, lines 32-34) for the benefit of providing solid-state white emitting lamps with high efficacy and good color rendering (column 3, lines 53-55) and for utilizing a wider variety of high efficiency phosphors (column 7, lines 32-34).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the semiconductor light emitting device of Shimizu et al. with the phosphor of Tarsa et al. that has an excitation wavelength of about 200-550 nm

for the benefit of providing solid-state white emitting lamps with high efficacy and good color rendering (column 3, lines 53-55) and for utilizing a wider variety of high efficiency phosphors (column 7, lines 32-34).

Conclusion

25. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Kano et al., US 3,875,456 disclose a multi-color semiconductor lamp comprising a plurality of light emitting diodes disposed close to one another and respectively emitting the light of different colors and a light scattering layer covering these light emitting diodes.

Sosniak et al., US 2003/0030063 disclose a light emitting array comprised of a plurality of light emitting diodes of different colors, including a blue or near ultraviolet LED coated with a phosphor and a diode that emits red light.

Nagai et al., US 2006/0180818 disclose an LED array chip that includes blue LEDs and red LEDs.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to W. Wendy Kuo whose telephone number is (571) 270-1859. The examiner can normally be reached Monday through Friday 7:30 AM to 5:00 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Angela Ortiz can be reached at (571) 272-1206. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Wenxing Wendy Ko

WWK

ANGELA ORTIZ
SUPERVISORY PATENT EXAMINER

7/2007